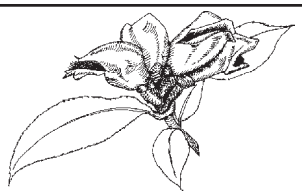
The Sewanee PLANT PRESS



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Late Bloomers

Labor Day is not the end of summer but only the start of the blooming season for some of our Sewanee area wildflowers. A walk around Lake Cheston or some other wet area will likely lead the hiker to a few examples. The orchid, White Nodding Ladies'-Tresses, *Spiranthes cernua* (L.) L.C. Rich., is quite noticeable with its rounded white flowers, bases arched downward, apparently spiraling around the stalk, which can reach one foot in height. The common name is due to the resemblance of the inflorescence to some styles of braided hair, while the genus name is derived from *speiros*, spiral, and *anthos*, flower. The flowers are often quite fragrant. This orchid is second only to Rattlesnake Plantain, *Goodyera pubescens* (Willd.) R.Br. ex Ait. f., in having the largest population of an orchid species in the Southern Appalachians, and is found throughout eastern North America.

A similar orchid, Slender Ladies'-Tresses, *Spiranthes lacera* (Raf.) Raf., blooms somewhat earlier in the summer. These orchids have an interesting relationship with their bee pollinators. The flowers mature starting at the base of the spike, so that the lower flowers are ready to receive pollen while the upper ones are still releasing pollen. The bees begin at the spike base and move up, then fly to another and begin at the base again, thus picking up pollen and transferring it to the flowers ready to receive it.

White Turtlehead, *Chelone glabra* L., is found in some of the same wet areas as the Ladies'-Tresses, in moist, sunny spots. *Chelone* is not really the most appropriate name for it, since it means "tortoise" in Greek and tortoises live on dry land, not in the water. It is a member of the figwort family, Scrophulariaceae, which has one of the longest family names in plant taxonomy and includes the garden snapdragons. The turtlehead flowers, strongly two-lipped and more than an inch long, are "densely bunched like a tight, dirty white bouquet at the stem tops" (Eastman, 1995), which sometimes fall over from the weight. These flowers rely for pollination on larger bees, which have the strength to force their way through the tight lips and past the green sterile filament to get to the nectar deep in the flower tube. They are widespread in eastern North America but usually occur in small clumps in scattered locations.

Another wildflower of damp places that relies on large bees, especially bumblebees, for pollination is the Bottle or Soapwort Gentian, *Gentiana saponaria* L. The vaselike flowers clustered at the tip of the 12-inch or more high stems are a striking blue color, and the petals are connected and nearly closed at the tip. This protects the nectar from rain and other insects, but the bumblebees can push their way in. The

name "gentian" is said to come from King Gentius of ancient Illyria, in the region of Albania and the former Yugoslavia, who used the roots of the European yellow gentian medicinally around 200 B.C. Gentian extract is still used today, in Angostura Bitters and other products.

Along streams and in wet meadows grows the Kidney-Leaf Grass-of-Parnassus, *Parnassia asarifolia* Vent., which is not a grass at all but a member of the saxifrage family. The basal leaves are in fact kidney-shaped, as is the smaller, clasping, single stem leaf. The single flowers rise six inches or so above the ground and have five cream-white petals with prominent green veins. These veins act as nectar guides, showing up well to pollinators against the white, which weakly reflects UV light. Further attractants for pollinators are the sham nectaries, stalked filaments that bear glands that look like nectar droplets but are actually dry. A related Old World species, *Parnassia palustris*, was supposedly first discovered on the slopes of Mt. Parnassus in Greece.

These flowers are quite distinctive and attractive, once they are spotted among the grasses and sedges and other plants of the wet areas where they grow. Others that also bloom late are harder to observe. The Autumn Coralroot orchid, *Corallorhiza odontorhiza* (Willd.) Poir., has no leaves and very small purplish-green flowers on thin six- to eight-inch stems, making it quite inconspicuous. The absence of leaves is a clue that it finds its nourishment through an association between its rhizomes (underground stems that look like branched, knotty coral) and a fungal partner, which is interconnected with the roots of green plants nearby. This arrangement is called epiparasitism.

continued on page 4

Plateau Ephemeral Ponds

Scattered throughout the forests of the Southern Cumberland Plateau are hundreds of small ephemeral ponds that provide important habitat for a variety of wetland-dependent plant and animal species. These tear-drop shaped pools are usually less than an acre in size and rarely more than a meter deep. They fill with water in the late fall and remain full until late spring/early summer. Evapotranspiration associated with the surrounding red maple, black gum and white oak trees causes the ponds to dry up during the summer months, unless conditions are unusually wet, as they have been this year.

In November, marbled salamanders make their pilgrimage to the dry ponds to lay eggs in a loose clutch under logs and newly fallen leaves. Females subsequently stay nestled with their bodies curled around their eggs until the water finally returns by December. On the first mild, rainy night in February, spotted salamanders make their pilgrimages to the ponds to lay eggs in large gelatinous masses in the water. Both marbled and spotted salamanders will travel hundreds of meters to return to their ancestral ponds.

Tree frogs, toads, spring peepers and leopard frogs also breed in these ponds making them points of intense amphibian music on late spring evenings. It is the ephemeral nature of the ponds that allows them to be successful breeding areas for these species. The drying up of the ponds prevents the establishment of potential predator species such as fish and bullfrogs which require permanent water bodies to maintain populations.

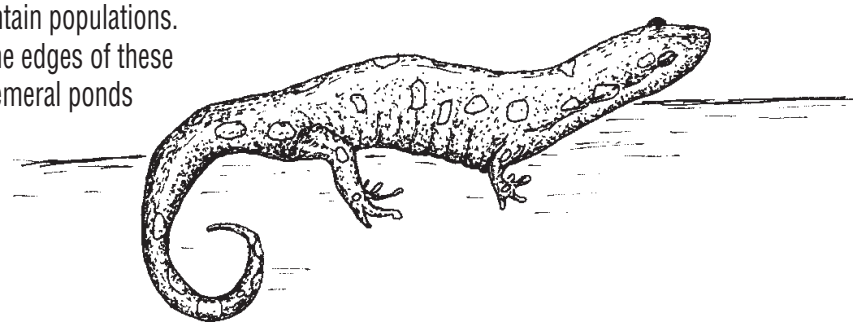
The edges of these ephemeral ponds provide special habitat for an obscure member of the Gentian family: *Bartonia virginica* (yellow screwstem). This annual herb, with its minute leaves and tiny greenish flowers, looks like slender green threads coming out of the ground. For the last five years this species has not been sighted at any of the ephemeral ponds around Sewanee. Then suddenly this year it is very common. It would appear that *Bartonia* populations remain dormant during dry years and only successfully establish adult plants during wet years when the ponds remain full through most of the summer.

Faculty and students in the Biology Department have embarked on a multi-pronged study of the ecology of ephemeral ponds on the Plateau. Brett Scheffers ('05) received a duPont Student Research Award to spend part of this past summer in the Landscape Analysis Lab carefully mapping the location of ephemeral ponds in a seven county area using aerial imagery on our GIS system. This semester, he is working with Chris Butler (Visiting Assistant Professor) and me to conduct a GIS analysis of the effect of land-use change on the density and ecological condition of these ponds across the Plateau landscape.

In August, Brett Scheffers, Bert Harris ('06) and biology professor David Haskell presented a paper at the Annual Meeting of the American Ornithological Society in Quebec on the importance of ephemeral ponds as nodes of bird diversity on the Plateau. This semester my Plant Systematics course will be inventorying plant diversity associated with ponds in the Sewanee vicinity.

Unfortunately, ephemeral ponds do not benefit from wetlands protection in Tennessee. Preliminary results from our GIS research indicate that this critical network of isolated wetland habitats may be disintegrating under the pressure of pine conversion and housing development on the Plateau. The Sewanee Herbarium and the Landscape Analysis Lab will be working in the future to promote awareness of the ecological importance of these ponds through our outreach programs and websites.

—Jon Evans
Sewanee Herbarium Director



THE PLANT PRESS

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Drawings are by Mary Priestley: turtlehead, Gentiana*, spotted salamander,* Bartonia*, and* Parnassia

Autumn Calendar of Events

Abbott Cotten Martin Ravine, "Abbo's Alley"
Sat., Sept. 25, 8 AM, Mary Priestley

Mary 's "Guided Walk through Abbo's Alley" on Sewanee's Family Weekend has become a tradition. All are welcome. Meet in the campus Quadrangle (beside All Saints' Chapel) for this easy one-hour walk.

Lake Cheston
Sun., Sept. 26, 3:30 PM, Herbarium Staff

Wander around Lake Cheston to view the fall flowers, which are particularly fine this year because of the University's considerate mowing policy. Meet at the pavilion for this easy one-hour walk.

Mountain Goat Railroad Biking/Walking Trail
Sat., Oct. 2, 10 AM, Yolande Gottfried

This portion of the old railroad bed was newly-paved this past summer for easy walking and biking. Meet at the Sewanee Market.

Favorite Campus Trees
Sun., Oct. 17, 2 PM, George Ramseur

Join botany professor *Emeritus* Dr. Ramseur for an easy ramble around the Sewanee campus and visit some outstanding specimens, including the famous "Moon Tree," for interesting facts, tips for identification, and explanations of the mysteries of the fall color change. Meet in front of All Saints' Chapel.

Homecoming Open House
Fri., Oct. 22, 4-5 PM

Stop by the Herbarium before heading to Guerry Garth for the Faculty/Alumni Wine & Cheese Reception. We are located on the ground floor of Woods Labs science building, near the greenhouse. Come meet the staff, including Professors George Ramseur and Jon Evans, learn about our latest projects, and pick up copies of some of our publications, including *Sewanee Spring Wildflowers* by Mary Priestley and various brochures on Biodiversity on the Mountain. You don't have to be an alum—just come!

Phone Yolande Gottfried at 931.598.3346 or email at <ygottfri@sewanee.edu> for more information about any of these events.

All Taxa Biodiversity Inventory for State Parks

Tennessee's Division of State Parks is launching an exciting venture: an inventory of all plants, animals, fungi, and other living things that inhabit the parks. Eventually, they hope to have inventoried all 54 state parks.

The state is teaming up with universities to get the job done. Park rangers and other staffers met with university faculty members from across the state in August to begin planning the project. State Parks biologist LinnAnn Welch coordinated the meeting. Yolande Gottfried and I represented Sewanee.

The state park closest to Sewanee and the one with which we are most involved is South Cumberland State Recreation Area. It is actually comprised of several different parks, including the Savage Gulf State Natural Area, Fiery Gizzard Cove, TVA's Foster Falls, Sewanee Natural Bridge (which the University deeded to the State in 1974), Carter State Natural Area (the location of Lost Cove Cave), and Hawkins Cove (where the endangered Cumberland rosinweed is protected). Botanically, both Savage Gulf and Fiery Gizzard have been inventoried, but there is much to be learned about all of these rich and biodiverse natural areas. We look forward to participating in this endeavor.

—Mary Priestley, Herbarium Curator

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Membership Application/Renewal

The Friends of the Sewanee Herbarium support the work of the Herbarium: education, research, and conservation. A $10.00 annual contribution would be very much appreciated. The date of your most recent contribution is printed on your address label.

Name and Address (if different from that on the mailing label on the back):

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Amount Enclosed: o $10.00 o Other: $ _____

Please make check payable to The University of the South. Gifts are fully tax deductible. Send to:

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Sewanee, TN 37383

Others who might like to receive *The Sewanee Plant Press*: _____

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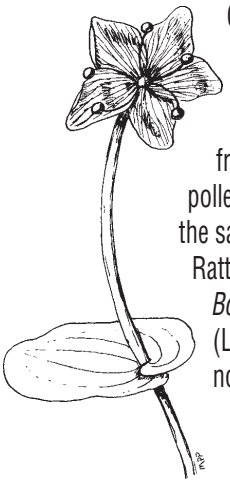
Late Bloomers *continued from page 1*

Other epiparasites that can be found blooming in the fall are Indian-Pipe and Pine-Sap, both in the genus *Monotropa*. The pale, nearly leafless flowering plants are only a few inches high and hard to see against the leaf litter of the forest floor. Indian-Pipe has a single flower and is commonly white, while Pine-Sap has several flowers and is more yellowish-brown. A non-flowering plant, the evergreen Grapefern is also often overlooked in the fall, although this is when it bears its fertile fronds and releases pollen. Another member of the same genus, the Rattlesnake Fern, *Botrichium virginianum* (L.) Swartz, is much more noticeable in the spring, when its herbaceous sterile and fertile fronds rise well above the forest floor.



It seems fitting to conclude with a small tree or shrub that can be considered either the last or the first to flower, American witch-hazel, *Hamemelis virginiana* L., which can be found in bloom from September to December. The yellow spidery flowers usually occur in groups of three in the leaf axils and the fruits mature the following year at flowering time, so the plant is dispersing seed at the same time that the next generation is being fertilized. This plant is the source of the familiar witch-hazel oil. Look for it in dry to mesic woodlands, sometimes along streams, for a breath of "spring" as winter approaches.

—Yolande Gottfried,
Herbarium Associate Curator

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